Claims

[c1]   What is claimed is:

1. A method for dynamically compensating for the imprecision of a timer, the timer repeatedly triggering a reference event according to a predetermined time interval, the method comprising the steps of:

storing a threshold value;

storing a count value corresponding to a plurality of reference events generated from the timer;

tracking an actual time interval between a first reference event and a second reference event occurring after the first reference event;

calculating a compensation value from the predetermined time interval and the actual time interval; and

utilizing the compensation value for reducing a difference between the count value and the threshold value.

[c2]   2. The method of claim 1 further comprising generating an acknowledgement event if the count value reaches the threshold value.

[c3]   3. The method of claim 1 wherein the step of tracking the actual time interval further comprises tracking an actual time interval between every two adjacent reference

events.

[c4]　4. The method of claim 3 wherein the step of tracking the actual time interval further comprises utilizing a reference clock for computing a time value corresponding to the actual time interval between every two adjacent reference events, and resetting the time value before the reference clock starts tracking the actual time interval between the first reference event and the second reference event.

[c5]　5. The method of claim 1 wherein the step of calculating the compensation value further comprises determining the compensation value by calculating a ratio of the actual time interval to the predetermined time interval.

[c6]　6. The method of claim 5 wherein the step of calculating the compensation value further comprises utilizing an integer closest to the ratio to be the compensation value.

[c7]　7. The method of claim 5 wherein the compensation value is a floating point value, and records the ratio of the actual time interval to the predetermined time interval.

[c8]　8. The method of claim 1 wherein an initial value of the threshold value is greater than an initial value of the count value, and the step of utilizing the compensation

value for reducing the difference further comprises increasing the count value and reducing the threshold value for reducing the difference by the compensation value.

[c9] 9. The method of claim 1 wherein an initial value of the threshold value is greater than an initial value of the count value, and the step of utilizing the compensation value for reducing the difference further comprises adding the compensation value to the count value without adjusting the threshold value for reducing the difference by the compensation value.

[c10] 10. The method of claim 1 wherein an initial value of the threshold value is less than an initial value of the count value, and the step of utilizing the compensation value for reducing the difference further comprises decreasing the count value and increasing the threshold value for reducing the difference by the compensation value.

[c11] 11. The method of claim 1 wherein an initial value of the threshold value is less than an initial value of the count value, and the step of utilizing the compensation value for reducing the difference further comprises subtracting the compensation value from the count value without adjusting the threshold value for reducing the difference by the compensation value.

[c12]   12. The method of claim 1 wherein the reference events are system interrupts.

[c13]   13. A method for dynamically compensating for the imprecision of a timer, the timer repeatedly triggering a reference event, the method comprising the steps of:

storing a threshold value and a count value;

tracking an actual time interval between every two reference events; and

updating the count value by a value calculated through accumulating a plurality of actual time intervals corresponding to a plurality of reference events.

[c14]   14. The method of claim 13 further comprising generating an acknowledgement event if the count value reaches the threshold value.

[c15]   15. The method of claim 13 wherein the step of tracking the actual time interval further comprises tracking the actual time interval between every two adjacent reference events.

[c16]   16. The method of claim 15 wherein the step of tracking the actual time interval further comprises utilizing a reference clock for computing a time value corresponding to the actual time interval between every two adjacent reference events, and resetting the time value before the

reference clock starts tracking the actual time interval between a first reference event and a second reference event.

[c17]   17. The method of claim 13 wherein the reference events are system interrupts.

[c18]   18. A timer system comprising:
a timer for repeatedly triggering a reference event according to a predetermined time interval;
a first storage unit for storing a threshold value;
a second storage unit for storing a count value corresponding to a plurality of reference events generated from the timer;
a tracking module electrically connected to the timer for tracking an actual time interval between a first reference event and a second reference event occurring after the first reference event;
a calculating module electrically connected to the tracking module for calculating a compensation value from the predetermined time interval and the actual time interval; and
a compensating module electrically connected to the calculating module and at least one of the first and second storage units for reducing a difference between the count value and the threshold value.

[c19]   19. The timer system of claim 18 further comprising a decision logic electrically connected to the first and second storage units for generating an acknowledgement event if the count value reaches the threshold value.

[c20]   20. The timer system of claim 18 wherein the first and second storage units, the counting module, the calculating module, compensating module, and the decision logic are positioned within a microprocessor, and the timer is driven by the microprocessor.

[c21]   21. The timer system of claim 18 wherein the tracking module comprises a clock generator for serving as a reference clock, and the tracking module utilizes the reference clock for computing a time value corresponding to the actual time interval between every two adjacent reference events, and resets the time value before the reference clock starts tracking the actual time interval between the first reference event and the second reference event.

[c22]   22. The timer system of claim 18 wherein the compensating module determines the compensation value by calculating a ratio of the actual time interval to the predetermined time interval.

[c23]   23. The timer system of claim 22 wherein the compen-

sating module utilizes an integer closest to the ratio to be the compensation value.

[c24]   24. The timer system of claim 22 wherein the compensating module utilizes a floating point value to be the compensation value for recording the ratio of the actual time interval to the predetermined time interval.

[c25]   25. The timer system of claim 18 wherein an initial value of the threshold value is greater than an initial value of the count value, and the compensating module increases the count value and reduces the threshold value for reducing the difference by the compensation value.

[c26]   26. The timer system of claim 18 wherein an initial value of the threshold value is greater than an initial value of the count value, and the compensating module adds the compensation value to the count value without adjusting the threshold value for reducing the difference by the compensation value.

[c27]   27. The timer system of claim 18 wherein an initial value of the threshold value is less than an initial value of the count value, and the compensating module decreases the count value and increases the threshold value for reducing the difference by the compensation value.

[c28]   28. The timer system of claim 18 wherein an initial value

of the threshold value is less than an initial value of the count value, and the compensating module subtracts the compensation value from the count value without adjusting the threshold value for reducing the difference by the compensation value.

[c29]   29. The timer system of claim 18 wherein the reference events are system interrupts of the timer system.

[c30]   30. A timer system comprising:
a timer for repeatedly triggering a reference event;
a first storage unit for storing a threshold value;
a second storage unit for storing a count value;
a tracking module electrically connected to the timer for tracking an actual time interval between every two reference events; and
a calculating module electrically connected to the tracking module for updating the count value by a value calculated through accumulating a plurality of actual time intervals corresponding to a plurality of reference events.

[c31]   31. The timer system of claim 30 further comprising: a decision logic electrically connected to the first and second storage units for generating an acknowledgement event if the count value reaches the threshold value.

[c32]   32. The timer system of claim 30 wherein the first stor-

age unit, the second storage unit, the calculating module, and the decision logic are positioned within a microprocessor, and the timer is driven by the microprocessor.

[c33] 33. The timer system of claim 30 wherein the tracking module comprises a clock generator for generating a reference clock, and the tracking module utilizes the reference clock for computing a time value corresponding to the actual time interval between every two adjacent reference events, and resets the time value before the reference clock starts tracking an actual time interval between a first reference event and a second reference event.

[c34] 34. The timer system of claim 30 wherein the reference events are system interrupts of the timer system.